

We claim:

1. A cutting tool and track system, comprising:

at least one track element configured to be attached to a surface of a workpiece, the track element including a track member and a rack member supported along the longitudinal length of the track member and defining a transport path;

a carriage assembly configured to ride along and to be guided and supported by the track element;

a carriage drive mechanism arranged to drivingly engage the carriage assembly and to drive the carriage assembly along the track element;

a cutting tool assembly carried by the carriage assembly, the cutting tool assembly including a cutting tool arranged to be rotated about a longitudinal axis and to be fed both along its axis of rotation and transversely of its axis of rotation for cutting a workpiece through a wall thickness of the workpiece; and

a tool driving system connected to and arranged to transmit rotary input motion to the cutting tool.

2. The cutting tool and track system according to claim 1, wherein the track element comprises:

at least two supports connected to a bottom surface of the track member and configured to be attached to a workpiece;

wherein each of the supports is configured to be attached to a securing element supported on the workpiece.

3. The cutting tool and track system according to claim 2, wherein each of the securing elements includes a mount plate supported on the workpiece and a plurality of studs extending therefrom, the supports configured and arranged to receive and secure to the studs of the securing elements.

4. The cutting tool and track system according to claim 2, wherein the securing elements are studs supported on the workpiece, the supports configured and arranged to receive and secure to the studs.

5. The cutting tool and track system according to claim 1, wherein the carriage assembly comprises:

a carriage deck configured to carry the cutting tool assembly and having at least two threaded holes extending therethrough; and

at least two adjustable bearing assemblies received and retained by the threaded holes of the carriage deck, each bearing assembly including a pin element extending through a threaded sleeve member positioned in operative engagement with one of the threaded holes, and a plurality of conical compression-type springs, a distal end of the pin

element engaging a bearing, the bearing assembly including a retaining nut engaging the sleeve member and positionable against the carriage.

6. The cutting tool and track system according to claim 4, wherein the carriage assembly further comprises a cam arrangement including:

a plurality of cam followers fixed to the carriage deck and arranged to ride along the track member; and

at least two adjustable cam followers adjustably secured to the carriage deck and configured to be positioned against the track member.

7. The cutting tool and track system according to claim 1, further comprising:

an angle plate having first and second plate portions oriented perpendicular to one another, said angle plate arranged to support the cutting tool assembly along the first plate portion and be supported to the carriage assembly on the second plate portion.

8. The cutting tool and track system according to claim 1, further comprising a feed assembly including:

an upper plate having an upper hole and arranged to connect to the cutting tool assembly, a ratchet assembly being positioned within the upper hole;

a lower plate having a lower hole and arranged to connect to the first plate portion of the angle plate, a feed nut being positioned within the lower hole;

a feed screw extending through the upper holes engaging the ratchet assembly and engaging the feed nut of the lower hole; and

a lever secured to the feed screw, the lever manipulable so as to rotate the feed screw to linearly displace the spindle of the cutting tool assembly in relation to the angle support.

9. The cutting tool and track system according to claim 1, wherein at least two track elements are provided and arranged to be assembled on a workpiece in an end-to-end relationship defining a continuous transport path.

10. The cutting tool and track system according to claim 1, wherein the cutting tool is an end mill.

11. A method for cutting a hollow workpiece, including at least one cutting tool assembly rotatably supporting an end mill driven for rotation about a tool longitudinal axis and mounted for travel along a

predetermined transport path transversely of its rotational axis about a central axis of the workpiece in a cutting plane, the method comprising:

rotating the end mill and feeding it along its rotary axis through at least a portion of the wall thickness of the workpiece; and

moving the cutting tool assembly along the transport path to cut the workpiece.

12. The method according to claim 11, wherein the end mill is firstly driven through the entire wall thickness of the workpiece thereby cutting through the entire wall thickness and then the cutting tool assembly is moved along the transport path.